DOCUMENT RESUME

ED 382 039 FL 023 042

AUTHOR Niang, Mamadou
TITLE Gemination Processes: Motivation, Form, and Constraints.
PUB DATE 95
NOTE 15p.; For complete volume, see FL 023 039.
PUB TYPE Reports - Research/Technical (143) -- Journal Articles (080)
JOURNAL CIT Kansas Working Papers in Linguistics; v20 p39-52 1995

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Consonants; *Dialects; *Fulani; *Phonology; Structural Analysis (Linguistics); Uncommonly Taught Languages
IDENTIFIERS *Geminates; *Pulaar

ABSTRACT

Gemination in Pulaar, a dialect of Fula, does not always follow typically known gemination processes and previous attempts to analyze Pulaar gemination processes have been unsatisfactory. The proposed analyses fail to account for numerous exceptions and do not provide a comprehensive analysis of all gemination processes in Pulaar. In this paper, the shortcomings of previous analyses are shown, and a satisfactory and comprehensive account of gemination processes in Pulaar is provided. Contains 17 references. (Author/JL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
S Mbnuel
Dupont
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

ED 382 039

GEMINATION PROCESSES: MOTIVATION, FORM AND CONSTRAINTS

MAMADOU NIANG
UNIVERSITY OF MISSOURI - KANSAS CITY

Abstract: Gemination in Pulaar, a dialect of Fula, does not always follow typically known gemination processes and previous attempts to analyze Pulaar gemination processes (McIntosh 1985, Paradis 1992, Bakovic 1995) were unsatisfactory. The proposed analyses fail to account for numerous exceptions and do not provide a comprehensive analysis of all gemination processes in Pulaar. In this paper I show the shortcomings of previous analyses and provide a satisfactory and comprehensive account of gemination processes in Pulaar.

Introduction

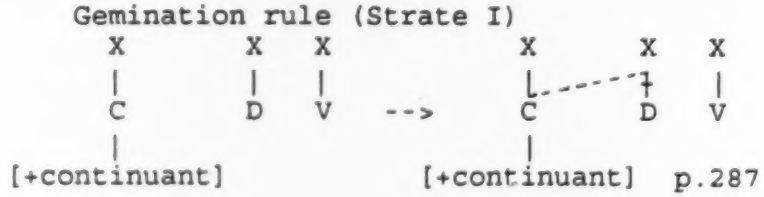
Gemination in Pulaar can take various forms and be triggered by various suffixes. Three gemination processes occur in Pulaar. The first type is triggered by the addition of consonant initial suffixes. Contrary to other claims (Paradis 1992), this type of gemination process is not unidirectional. The second gemination process results from the addition of certain vowel initial suffixes. The third type occurs in word initial position. This type of gemination is triggered by the presence of word medial geminates. In the process of analyzing these gemination processes, motivations for and constraints on these processes are highlighted. The letter D stands for a dental implosive, B a bilabial implosive, Y a palatal implosive and ? a glottal stop.

Previous Analyses

In her analysis, Paradis (1993) indicates that gemination in Pulaar is triggered by DV markers. She proposes the gemination rule in (1).

1)

Gemination rule (Strate I)



p.287

However, in many instances, gemination fails to apply despite the presence of dV markers as illustrated in (2)

2)

bale	de	[bale de]	"the walls"
gite	de	[gite de]	"the eyes"
nate	de	[nate de]	"the pictures"
jale	de	[jale de]	"the hoes"
maje	de	[maje de]	"the lightnings"

Paradis indicates that /ñ, r, w, y/ do not have geminate counterparts. The data in (3) contradicts this claim.

3)

ññ	sóññude/aññeere	"to move gently/grave"
ww	jawwude/lówwirde	"to catch fire/walk around"
yy	sayyaade/layyaade	"to swing/slaughter"

The gemination of r is observed only in borrowed words as in (4)

4)

qirraade	"ascertain"
berraade	"teapot"

Bakovic (1995) whose analysis is based on Paradis (1992) suffers from the same limitations pertaining to the source. In what follows, I provide a comprehensive analysis of all types of gemination processes, viz, gemination from consonant assimilation, vowel initial suffixation and word initial gemination.

I) Gemination from Consonant Assimilation

Gemination from consonant assimilation is triggered by the fact that certain consonant sequences (mostly coronals) /tn, dn, Dn, yn, jn, dt, Dt, Yt, jt, td, Dd, jd, tD, dD, YD, jd, Yd/ are not allowed in Pulaar. Whenever an impermissible sequence is to result from the juxtaposition of certain elements, one of the consonants assimilates to the other consonant. The type of assimilation that obtains generally involves total assimilation, thus indicating why delinking is invoked. Delinking triggers spreading onto the empty slot. The analysis adopted here shows that spreading is not unidirectional. Instead, spreading can be from left to right of from right to left.

To account for gemination processes in Pulaar the following analysis is proposed.

-Delinking
-Spreading (gemination/vowel lengthening)

The suffixes analyzed here are the causative suffix {-n}, the infinitive suffix {-de}, the relative suffix {-Do} and the reversive suffix {t}. In what follows, the operation of the proposed analysis is discussed and data is provided to determine its adequacy.

Considering the data in (5)

5)

mut	+	n + u	[munnu]	"make go under water"
wood	+	n + u	[wóónnu]	"make exist"
hoD	+	de	[hodde]	"inhabit"
fot	+	de	[fodde]	"to fit"
naat	+	Do	[naaDDo]	"person who entered"
laad	+	Do	[laaDDo]	"person who crawled"
waD	+	t + i	[watti]	"has done again"
sood	+	t + i	[sooti]	"freed himself"

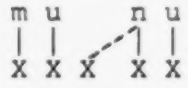
In (5) we note a change in one of the adjacent consonants. The stem final consonant is assimilated and the suffix consonant is geminated.

-Delinking leaves an empty X-slot as illustrated in (6).

6)

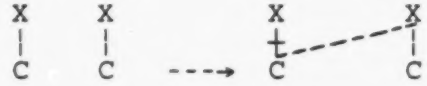
-Spreading of the suffix consonant fills the empty X-slot and gemination results as in (7).

7)



This type of gemination can be captured by the rule in (8)

8)



Leftward spreading occurs filling the empty X-slot. However, this is not the only direction that obtains in Pulaar as shown by the analysis of the data in (9).

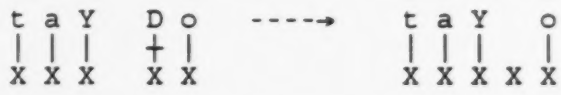
9)

Stem	+	rel. suffix		
taY	+	Do	[taYYo]	"person who is worn out"
deeY	+	Do	[deeYYo]	"person who is calm/quiet"
fij	+	de	[fijje]	"to play"

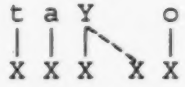
In (9), the suffix consonant is the one undergoing assimilation. The stem final consonant is geminated.

-Delinking leaves an empty X-slot as illustrated in (10)

10)



-Rightward spreading occurs, filling the empty X-slot thus resulting in gemination as illustrated in the following.



Unlike what obtains in the gemination processes analyzed so far in this section concerning assimilation processes, the spreading in (10) is from right to left. However, these processes are not the only ones that obtain in Pulaar as shown by the analysis of the data in (11).

11)

maaj	+	n + u	[maañ̃u]	"make someone salute"
haac	+	de	[haajje]	"to scream"
waaY	+	de	[waajje]	"to sweat"
maaj	+	Do	[maaYYo]	"person who saluted"

In (11) gemination occurs. This gemination process is somewhat different from the types analyzed so far. In previous instances involving assimilation, after delinking, the features of one segment spread onto the X-slot of the stem final consonant or the suffix initial X-slot. The features of the segment where spreading originates are not affected at all. In (11) a different process occurs. After gemination we get the form [maañ̃u] not [maannu] or [maajju]. When viewed like the usual spreading of features to a slot which has become vacant because of delinking, we will not be able to account for the gemination that resulted. The delinking from the stem final consonant yields the geminates [maannu] and [aatto]. The delinking of the suffix initial consonant yields the geminates [maajju] and [aayyo] and these geminate forms are different from the surface forms in (11). If delinking is not invoked, we cannot explain why spreading occurs. It is argued here

that delinking occurs first because without delinking, there is no motivation for spreading to occur. However, the palatal feature of the delinked element remain "floating" thus causing the dental nasal consonant suffix to surface as a palatal nasal. If the palatal features did not remain "floating" there is no way of accounting for the palatalization of the dental nasal. This assimilation is reciprocal between the segments in question.

In addition to gemination from consonant assimilation, gemination can also result from vowel initial suffixation.

II) Gemination from Vowel Initial Suffixation

For the analysis of this type of gemination, an important distinction needs to be made between underlying and non underlying geminates. The following data is to illustrate underlying geminates (12).

12)

bajj	+	-o	[bajjo]	"one and only"
ball	+	-a	[balla]	"male first name"
moYY	+	-o	[moYYo]	"good"
lett	+	-o	[letto]	"squint-eyed person"
Dojj	+	-o	[Dojjo]	"cough"

The forms in (12) are underlying geminates because they do not change from singular to plural or from the addition of both diminutive and augmentative suffixes. Unlike the -o and -a suffixes, other surface vowel initial suffixes like {-in} (causative suffix) and {-i} (plural marker) can lead to gemination as illustrated by the data in (13).

13)

waal	+	-in	[wallin]	"make spend the night"
laam	+	-in	[lammin]	"appoint a chief"
ñaam	+	-in	[ñammin]	"make eat"
saam	+	-in	[sammin]	"make fall"
leem	+	-in	[lémmin]	"make a wood pile"

The addition of the causative suffix leads to gemination and the previously long vowel is shortened. The previously long vowel is shortened only before a final heavy syllable.

Paradis (1992) indicates that the causative suffix is {-n}. If the causative suffix is -n, then we are dealing with an instance of vowel insertion which is supported by two observations. First, the insertion of the /i/ prevents the presence of a three consonant cluster, a sequence not allowed in the language.

In this case, insertion follows gemination. Second, /i/ occurs in the environment where insertion is expected, i.e. between the last two consonants of a three consonant cluster. However, considering {-n} as the causative suffix raises two problems. First, /i/ is not the vowel that is generally inserted to break a three consonant cluster in verbal complexes. Instead, /u/ is the vowel inserted to serve this purpose. Second, if the causative suffix is {-n} there is no way of accounting for the presence of gemination that results from the addition of this suffix to the stem. As indicated earlier, gemination from consonant assimilation occurs to prevent an impermissible sequence. The clusters mn, ln, wn, sn are permissible clusters as in (14).

14)

amnude	"to make dance"
haalnude	"to make speak"
séwnude	"to make slim"
hasnude	"to ready the dead for burial"

So if {-n} is the causative suffix, there is no motivation for gemination to occur. Besides, there are forms which take both {-n} and {-in} suffixes as illustrated by the data in (15).

15)

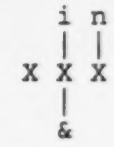
naat	+ in	--→	[nattin]	"make enter again"
naat	+ n + u	--→	[naannu]	"make enter"
sel	+ in	--→	[sellin]	"make recover"
sel	+ n + u	--→	[selnu]	"make branch"
deeY	+ n + u	--→	[deeññu]	"make calm"
deeY	+ in	--→	[deYYin]	"make quiet"

In (15) the suffixes {-n} and {-in} can both occur with the same root with different meanings. This situation is not expected if we are dealing with the same suffix. Therefore, the analysis adopted in this paper views {-n} and {-in} suffixes as different suffixes. Since there is no motivation for gemination to occur when {-n} alone is viewed as the causative suffix, this analysis considers the other alternative and take the causative suffix to be {-in}. In addition, this analysis is supported by the vowel shortening process discussed in (16a) and (16b).

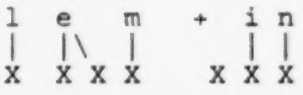
In previous instances we were dealing with gemination resulting from assimilation. The deletion of one of the consonants leads to the presence of an empty X-slot. Spreading fills the empty X-slot, thus leading to gemination. However, in these instances, no assimilation

occurs for us to invoke spreading. Spreading cannot occur without the presence of an empty X-slot. For this reason, the causative suffix is assumed to have an underlying featureless empty X-slot as in (16a).

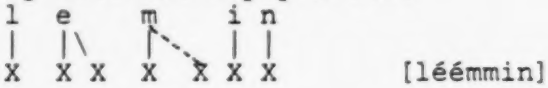
16a)



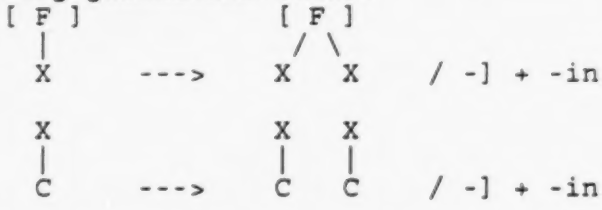
With this assumption in mind, the analysis is applied to determine its applicability to this type of gemination.



-Delinking: not applicable
-Spreading into the empty X-slot

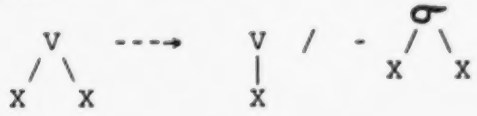


This type of gemination can be captured by either of the following gemination rules.



As formulated, the analysis does not provide an adequate account of the data in (15). This derived form [léémmin] is not the one obtained on the surface. In order to account for the data in (15) we need to add another component to our analysis. This component will be vowel shortening. This vowel shortening rule is formulated in (16b).

16b)



The application of this vowel shortening rule leads to the correct output [lémmin].

Prunet and Tellier (1984) claim that (C)VC suffixes do not shorten long vowels in word initial position when they indicate that

'... cette alternance n'affecte jamais une voyelle qui se trouve en initiale de radical: ...' p. 70

'... this alternation never affects a vowel in the first syllable of the stem/root: ...' (my translation).

The data in (15) analyzed in (16a) and (16b) indicates that this vowel shortening rule can also apply to certain instances with a long vowel in word initial position.

This vowel shortening also supports the analysis adopted here which considers {-in} as the suffix since the particular vowel shortening occurs only in the presence of a (C)VC or (C)VV suffix.

The other type of vowel initial suffix that causes gemination is the nominal plural suffix -i. In general, this plural suffix causes only the gemination of [+ continuants]. This vowel initial suffix is assumed to have the following representation (17).

17)

Considering the data in (18) and (19)

18) singular		19) plural	
a)		a')	
sóf-ru	"chick"	cópp-i	"chicks"
nóf-ru	"ear"	nópp-i	"ears"
hóf-ru	"knee"	kópp-i	"knees"
b)		b')	
saw-ru	"stick"	cabb-i	"sticks"
léw-ru	"moon"	lébb-i	"moons"
fów-ru	"hyena"	póbb-i	"hyenas"
c)		c')	
sóóy-ru	"type of bird"	cóójj-i	"types of birds"

As formulated, the analysis will not account for the data in (18) and (19). The analysis predicts the forms in (20).

20)

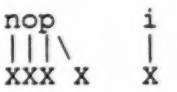
*/coffi; noffi; cooyyi/

In order to account for the data in (20), the addition of another component, consonant hardening, is necessary. Consonant hardening affects only s, f, h, w, y. The consonants /s, f, h/ do not geminate in Pulaar. That is, the forms /*ss , *ff, *hh/ do not occur in the language. Since these consonants do not have geminate forms, they are changed into segments that are allowed to geminate when the conditions for gemination are satisfied. The candidates for /s/ and /f/ could be their voiced counterparts /z/ and /v/ respectively. These, however, do not occur in the language. The /*yy, *ww/ do not occur in nominal complexes even though these last two occur in verbal complexes. These segments are therefore changed into forms that can be geminated. So s --→ c, f --→ p, h --→ k, w --→ b, y --→ j.

*/coffi, noffi, cooyyi/ ---> /coppi, noppi, coojji/ respectively.

Since this paper deals with gemination, we will deal only with the hardening of /s, f, h, w, y/ in relation to gemination. Also, consonant hardening in word initial position is addressed only when relevant to gemination processes. Consonant hardening can be captured by the following rule.

In order to analyze the forms in (18) and (19) various proposals can be made. One proposal can suggest that #nop# in (a), #leb# in (b), #cooj# in (c) are the underlying forms of the stems. The addition of the plural nominal suffix triggers gemination as the last consonant of the root stem links to the featureless empty X-slot of the suffix as illustrated in the following.



Another alternative is to view the singular forms as underlying. In this case the underlying form of the stem will be #sof-#. Since the segment /f/ does not have a geminate counterpart, a need to determine how the stem final segment is realized as /p/ in its surface form arises. One approach can invoke a process of hardening whereby /f/ changes into /p/, /w/ into /b/ and /y/ into /j/ when they occur in a gemination environment. These processes are illustrated in (21).

21)

```
# s o f #  +  i
  s o f     +  i
  | | |        |
  X X X     X  X
```

Rightward spreading occurs filling the empty X-slot thus leading to gemination as in (22).

22)

```
  s o f  +  i
  | | |     |
  X X X  X  X
```

Consonant hardening occurs changing ff into pp and we get the following structure.

[c o p p i]

The first proposal seems to follow the general gemination process whereby the stem final consonant links to the empty featureless X-slot of the vowel initial suffix. The rule changing the obstruents /p,b,j/ to /f, w, y/ respectively is also a plausible phonological operation. The second alternative also leads to gemination. However, the conditions that trigger the hardening of the stem final consonant remain to be determined.

In order to determine the adequacy of these proposals, the data in (23) is considered.

23)

Sing. diminutive	Sing. augmentative	Plur. diminutive
cóf-él	cof-al	cof-on
nóf-él	nof-al	nof-on
caw-él	caw-al	caw-on
léw-él (léwléwél)	lew-al (lewlewal)	lewlew-on

The addition of the singular diminutive suffix (-el), the singular augmentative suffix (-al) and the plural diminutive suffix (-on) leaves the [+cont.] forms unaltered. The only instances where we have the [-cont.]

forms are the geminated cases. Therefore this analysis views the [+cont.] forms as underlying.

A third alternative can view the plural forms as underlying and the singular ones as derived. In this case we will need a weakening/softening rule that will change the root final obstruents into /f/, /s/, /y/ or /w/. This third alternative is not supported by the data in (23).

In addition to the gemination processes in word medial position, gemination in Pulaar, contrary to other claims, can occur in word initial position.

III) Word Initial Gemination

Word intial geminates have been documented for Luganda and Ponapeian (Hayes, 1989). Geminates in Pulaar occur mostly in word medial position. No geminate consonant occurs in word final position. This constraint is due to the fact that Pulaar does not allow more than one consonant in word final position. In Pulaar, consonants can be geminated in word initial position as illustrated by the data in (24) and (25).

24)			25)	
celal	[celál]	"grass"	cellal	[ccellal]
pelal	[pelal]	"footprint"	pellal	[ppellal]
malal	[malal]	"first name"	mallól	[mmallól]
maje	[maje]	"lightnings"	majjere	[mmajjere]
paDal	[paDal]	"big shoe"	paDDal	[ppaDDal]
Balal	[Balal]	"big body"	Balli	[BBalli]
cadi	[cadi]	"are costly"	caD+ti	[ccatti]
bile	[bile]	"traps"	bille	[bbille]
cakalo	[cakalo]	"friendly"	cakkagol	[ccakkagol]
came	[came]	"smallpox"	cammeeje	[ccammeeje]

The stem initial consonant in (25) is pronounced as a geminate. The presence of a geminate medial consonant affects the stem initial consonant. That is, when there is a medial geminate consonant the hard form of the word initial consonant is pronounced as a geminate counterpart of the hard simple form. This type of gemination can be observed with other consonants that can normally be geminated as well. Gemination of the medial consonant causes the stem initial consonant to become geminated. This observation is reinforced by the fact that word initial segments that have already undergone the

hardening process become geminated in the presence of a medial geminate as in (26).

26)

saD + i	[saDi]	"is expensive"
caD + i	[caDi]	"are expensive"
caD + ti	[ccatti]	"are very expensive/rare"

Even when preceded by vowels, the word initial geminates are maintained as in (27).

27)

O fii mo mallól [o fii mo mmallól]
O naati e péllél ngél [o naatee ppéllél ngél]
Wuro heewngo majjere [wuro heewngo mmajjere]
O wuji e Balli [o wujee BBalli]

The only consonants that do not undergo this initial gemination are /y, w, f, s, h/. Interestingly enough these are the same consonants that do not have geminate forms in nominal complexes. Also, vowels in word initial position are also affected by the same process even though the realization is not the same as illustrated in (28) and (29).

28) **Simple form**		29) **Geminated form**	
aduna [aduna]	(world)	addude [?addude]	(bring)
asi [asi]	(dug up)	acci [?acci]	(let go)
ela [ela]	(dislike)	ella [?ella]	(period)
udumere [udumere]	(door)	uddugol [?uddugól]	(closing)
oto [oto]	(car)	óttude [?óttude]	(contract)

In this particular case, a glottal stop is inserted at the beginning of the word as illustrated in (29).

Despite the pervasiveness of word initial gemination, it is subject to certain constraints.

Constraints on Word Initial Gemination

Gemination in word initial position is subject to two constraints. First, word initial geminates do not occur when there is an intervening long vowel between the word initial consonant and the word medial geminates as illustrated in (30)

30)

mooY + de ---→	moojje [moojje]	*[mmoojje]
daaY + de ---→	daajje [daajje]	*[ddaajje]

As shown in (30), the initial consonant is not geminated when there is a long vowel intervening between the medial geminate and the word initial consonant.

Second, when the word initial segment is a type that does not have a geminate counterpart, then word initial gemination does not occur as in (31).

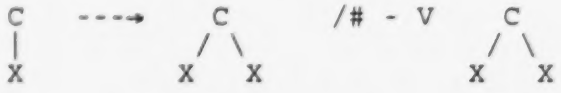
31)

sakkaade	"give charity"
hettere	"piece of e.g. meat"
fittude	"sweep"
rokkude	"give"

In (31) the word initial consonant is not geminated because it is not a consonant that is allowed to geminate. In addition, these consonants are not even changed into the forms that are allowed to geminate. So the analysis regarding consonant hardening will not apply in this particular case. However, when the word initial consonant is already in its hard form the presence of the word medial geminate will lead to the gemination of the word initial consonant as illustrated in (26).

A number of questions can arise pertaining to the analysis of this word initial gemination and how to represent these word initial geminates. The word initial gemination process can not be analyzed in terms of assimilation even though the gemination of the word initial consonant is triggered by the presence of the medial geminate. Another alternative is to view this initial gemination in terms of weight. As shown in previous studies (Hayes 1989) a segment can acquire weight when it is in a weight position. So the presence of a medial geminate renders the word initial position a weight position to which is assigned a mora or two skeletal slots. This word initial gemination can be captured by the following rule (32).

32)



Conclusion

The analysis of Pulaar gemination processes adopted in this paper has not only shown the inadequacy of previous analyses of gemination processes but also captures better the processes involved. The analysis that is proposed accounts for all types of gemination processes that obtain in Pulaar without having to segment the instances into different strata.

REFERENCES

Bakovic, Eric J. (1995). "Geminate Shortening in Fula," Trends in African Linguistics, 1, Africa World Press INC.

Davis, S. (1985a). "Syllable Weight in some Australian Languages," BLS II, 398-407.

Hayes, B. (1989). "Compensatory Lengthening in Moraic Phonology," Linguistic Inquiry, 20, 253-306.

Hyman, L. M. (1985). A Theory of Phonological Weight. Foris Publications, Dordrecht.

Paradis, C. (1992). Lexical Phonology and Morphology: the Nominal Classes in Fula. Garland, New York.

Postdam, E. (1992). "Syllable Structure in Kacecereere Fulfulde," ms., UC Santa Cruz.

Prunet, J. F. & C. Tellier (1984). "Interaction des Niveaux en Phonologie: l'Abregement Vocalique en Pulaar," McGill Working Papers in Linguistics, 2, 65-90.

Schein, Barr, & Donca Steriade (1986). "On Geminates," Linguistic Inquiry, 17, 4, 691-744.